# Compact and Long sensing distance

#### ■ Features

#### ■Long distance sensing type

- •Long sensing distance with high quality lens
- •Detects up to 15m(Through-beam type)
- ●Long sensing distance: Diffuse reflective type 1m, Polarized retroreflective type 3m(MS-2A)
- M.S.R (Mirror Surface Rejection) function (Polarized retroreflective type)
- •Compact size: W20×H32×L10.6mm
- •Protection structure IP65/IP67 (IEC standard)
- ●Light ON/Dark ON selectable
- •Sensitivity adjustment VR incorporated
- •Reverse polarity, Output short-circuit protection circuit
- •Auto mutual interference prevention function (Except through—beam type)
- Improved noise resistance and minimize effect of inverter disturbance light







Line-up
Connector Type

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## Specifications

★The model name with '-C' is connector type.

				* The model ha	inic with C is	connector type.
BJ15M-TDT-C	BJ10M-TDT-C	BJ7M-TDT	BJ3M-PDT-C	BJ1M-DDT-C	BJ300-DDT-C	BJ100-DDT BJ100-DDT-C
		BJ7M-TDT-P	BJ3M-PDT-C-P			BJ100-DDT-P BJ100-DDT-C-P
	Through-beam		Polarized retroreflective	Diffuse reflective		
0 to15m	0 to 10m	0 to 7m	(*1) 0.1 to 3m (MS-2A)	1m (Non-glossy white paper 300×300mm)	300mm (Non-glossy white paper 100×100mm)	100mm (Non-glossy white paper 100×100mm)
Opaque materia	al over ∮12mm	Opaque material over ø8mm	Opaque material over $\phi$ 7.5mm	Transl	ucent, Opaque r	materials
		<del></del>		Max. 2	20% at sensing	distance
			10% (Ripple P-			
Emitter/Receiver: Max. 20mA Max. 30mA						
Infrared LED (850nm)	Red LED (660nm)	Red LED (650nm)	Red LED (660nm)	Infrared LED (850nm)	Red LED (660nm)	Infrared LED (850nm)
			Built-in VR			
NPN or PNP open collector output  • Load voltage : Max. 26.4VDC • Load current : Max. 100mA • Residual voltage > NPN : Max. 1V, PNP : Min. (Power voltage -2.5V)						
tection circuit Reverse polarity protection, Output short—circuit protection			,			
Operation: Red, Stable: Green(Emitter's power indicator: Green)						
	B.	<b>J</b> 🖙 Outgoing c	able type, <b>BJ-C</b>	M8 Connec	tor	
		Max. 20	MΩ (at 500VDC	megger)		
ectric strength 1000VAC 50/60Hz for 1minute						
1.5mm or 300mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours			or 2 hours			
500m/s <sup>2</sup> X, Y, Z directions for 3 times						
ation Sunlight: Max. 11,000/x, Incandescent lamp: Max. 3,000/x (Receiver illumination)						
bient temperature Operation: -25 to 55℃, Storage: -40 to 70℃ (at non-freezing, at non-dew status)						
	Oper	ation & Storage	e: 35 to 85%RH	(at non-dew s	tatus)	
BJ ☞ IP65(IEC standard), BJ-C ☞ IP67(IEC standard)						
ial Case: PC+ABS, Lens: PMMA, LED Cap: PC						
(*2) BJ  \$\infty\$ \phi 3.5mm, 3P, Length : 2m(Emitter of through-beam type : \phi 3.5mm, 2P, Length : 2m) (24AWG, Core wire diameter: 0.08mm, No. of core wire: 40, Insulator diameter: 1mm)						
	M	ounting bracke	t, Bolt, Nut, VR	adjustment driv	er	
			Reflector (MS-2A)			
			CE			
BJ 🖙 Approx	к. 90g, <b>ВЈ-С</b>	Approx. 20g	<b>BJ</b> → Approx.60g, <b>BJ-C</b> → Approx.30g	BJ 🖙 Approx	x. 45g, <b>BJ-C</b>	Approx. 10g
	BJ15M-TDT-PBJ15M-TDT-C-P  0 to15m  Opaque materi  Emitte Infrared LED (850nm)  • Load voltage : M Revers Output  1.5mm o  S Ope  (*2)  BJ	BJ15M-TDT-C BJ15M-TDT-P BJ15M-TDT-P BJ15M-TDT-C-P BJ10M-TDT-P BJ10M-TDT-C-P  Through—beam  O to 10m  Opaque material over \$\phi\$ 12mm  Emitter/Receiver: Max  Infrared LED (850nm)  • Load voltage: Max. 26.4VDC • Load Reverse polarity protect Output short—circuit properation  Bit Sunlight: Max. 11  Operation: -25 to Oper BJ = (*2)  BJ = \$\phi\$ 3.5mm, 3P, (24AWG, Core we make the content of the c	BJ15M-TDT BJ15M-TDT BJ10M-TDT BJ15M-TDT-P BJ15M-TDT-P BJ10M-TDT-C-P BJ10	BJ15M-TDT BJ16M-TDT-C BJ10M-TDT-C BJ15M-TDT-C BJ15M-TDT-P BJ10M-TDT-P BJ10M-TDT-P BJ10M-TDT-C-P BJ10M-TDT-P BJ30M-PDT-C-P BJ10M-TDT-C-P BJ10M-TDT-C-P BJ10M-TDT-P BJ30M-PDT-C-P BJ10M-TDT-C-P BJ10M-TDT-P BJ30M-PDT-C-P BJ30M-PDT	Long distance sensing type  BJ15M-TDT   BJ10M-TDT-C   BJ7M-TDT   BJ3M-PDT   BJ1M-DDT-C   BJ15M-TDT-P   BJ10M-TDT-P   BJ10M-TDT-P   BJ10M-TDT-C-P   BJ10M-TDT-C-P   BJ10M-TDT-C-P   BJ10M-TDT-C-P   BJ10M-TDT-C-P   BJ10M-TDT-C-P   BJ10M-DDT-C-P   BJ3M-PDT-C-P   BJ1M-DDT-C-P   BJ3M-PDT-C-P   BJ1M-DDT-C-P   BJ3M-PDT-C-P   BJ1M-DDT-C-P   BJ3M-PDT-C-P   BJ	Long distance sensing type   BJ16M-TDT   BJ16M-TDT   BJ16M-TDT   BJ16M-TDT   BJ16M-TDT   BJ30M-PDT   BJ30M-PDT   BJ30M-DDT   BJ30D-DDT   BJ30D-DDT

**<sup>☀(\*1)</sup>** The sensing distance is extended to 0.1~4m or 0.1~5m when using optional reflector MS−2S or MS−3S.

(Cable 22AWG, Core wire diameter: 0.08mm, No. of core wire: 60, Insulator diameter: 1.25mm)

(B) Fiber

Photo electric sensor

(C) Door/Area

(D) Proximity sensor

(E) Pressure sensor

(F) Rotary encoder

(G) Connector/

Socket

Temp. controller

SSR/ Power controller

> (J) Counter

> > imer

(K)

(L)

Panel meter (M) Tacho/ Speed/ Pulse meter

(N) Display unit

(O) Sensor controller

(P) Switching power supply

(Q) Stepping motor & Driver & Controller

(R) Graphic/ Logic panel

(S) Field network device

(T) Production stoppage models & replacement

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**<sup>※(\*2)</sup>** M8 connector cable is sold separately.

# Transparent glass sensing/BGS reflective/Micro spot type

#### ■ Features

#### ■BGS reflective type

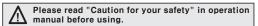
- •No effects of background object with Background Suppress(B.G.S) feature
- High characteristic then limited distance reflective type's and available for the sensing distance setting with volume
- •Narrow sensing width and visible spot type
- Stable sensing to minimize error range in color or glossy of sensing target

#### ■Transparent glass sensing type / Micro spot type

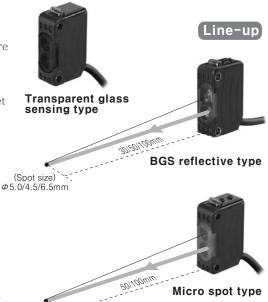
- •Stable sensing for transparent object (LCD, PDP, glass etc) by BJG30-DDT
- Easy to check sensing location with visible micro spot
- •Suitable for sensing small objects (Min. sensing object: *ϕ* 0.2mm pure copper wire)

#### **■**Commonness

- ●Compact size: W20×H32×L10.6mm
- •Protection structure IP65 (IEC standard)
- ●Light ON/Dark ON selectable (Except BJG30-DDT)
- •Sensitivity adjustment VR incorporated (Except BJG30-DDT)
- •Reverse polarity, Output short-circuit protection circuit
- •Auto mutual interference prevention function
- Improved noise resistance and minimize effect of inverter disturbance light







# ★Spot is visible with bare eyes (Spot size) φ2.0/2.5mm while beam (line) is not.

## Specifications

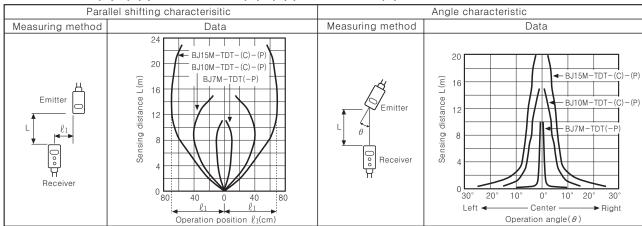
Туре	Transparent glass sensing type		BGS reflective type		Micro spot type		
평 NPN open collector output	BJG	30-DDT	BJ30-BDT	BJ50-BDT	BJ100-BDT	BJN50-NDT	BJN100-NDT
PNP open collector output	_		BJ30-BDT-P	BJ50-BDT-P	BJ100-BDT-P	BJN50-NDT-P	BJN100-NDT-P
Sensing type	Diffuse	reflective	BGS reflective		Narrow beam reflective		
Sensing distance	0 to 30mm	0 to 15mm	10 to 30mm (Non-glossy white paper 50×50mm)	10 to 50mm (Non-glossy white paper 50×50mm)	10 to 100mm (Non-glossy white paper 100×100mm)	30 to 70mm	70 to 130mm
Sensing target	100×100mm Non-glossy white paper	Transparent glass 50×50mm (t=3.0mm)	Transl	ucent, Opaque		,	paque materials
Min.diameter of transmitting SPOT		<u> </u>	Approx.	Approx.	Approx.	Approx. ∮2.0mm	Approx.
Min.sensing target							2mm(Copper wire)
Hysteresis	Max. 20% at	sensing distance	Max.	10% at sensing	distance	Max. 25% at sensing distance	Max. 20% at sensing distance
Response time	Ma	x. 1ms		Max. 1.5ms			. 1ms
Power supply			12-24VDC		P-P: Max.10%)	)	
Current consumption				Max. 30mA			
Light source/Wavelength		l LED(850nm)		Red LED(660n	im)	Red LEI	)(650nm)
Control output	<ul> <li>Load current</li> </ul>	ollector output e: Max. 26.4VDC t: Max. 100mA tage: Max. 1V	NPN or PNP Open collector output  • Load voltage: Max. 26.4VDC • Load current: Max. 100mA  • Residual voltage ☞ NPN: Max. 1V, PNP: Min. (Power voltage -2.5V)				
Sensitivity adjustment	Built-in VR						
Operation mode	Light ON mode fixed Light ON / Dark ON mode selectable (Short rotator adjuster)			adjuster)			
Protection circuit	Reverse polarity protection, Output short-circuit protection, Interference prevention function						
Indicator	Operation indicator: Red, Stability indicator: Green						
Connection	Outgoing cable type						
Insulation resistance	Min. 20MΩ (at 500VDC megger)						
Dielectric strength		1,000VAC 50/60Hz for 1minute					
Vibration	1.5mm or	1.5mm or 300m/s <sup>2</sup> amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours					
Shock				X, Y, Z direction			
Ambient illumination						eceiver illuminati	
Ambient temperature	Operation:-25 to 55℃, Storage:-40 to 70℃ (at non-freezing, non-dew status)						
Ambient humidity	Operation & Storage : 35 to 85%RH(at non-dew status)						
Protection	IP65 (IEC standard)						
Material	Case: PC+ABS, Lens: PMMA, LED CAP: PC						
Cable	∅ 3.5mm, 3P, Length : 2m						
Accessory	Mounting	bracket, Bolt			bracket, Bolt, A	djustment drive	r
Approval	CE						
Unit weight	Appr	ox. 45g		Approx. 50g		Appr	ox. 45g

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#### ■ Feature data

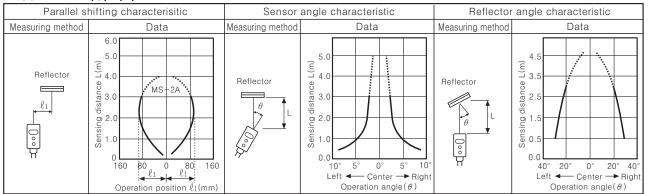
#### **OThrough-beam**

●BJ15M-TDT-(C)-(P) / BJ10M-TDT-(C)-(P) / BJ7M-TDT-(P)

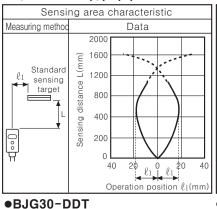


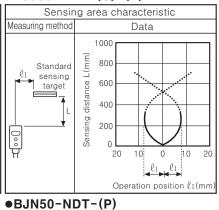
# **○Retroreflective type**

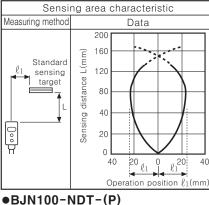
●BJ3M-PDT-(C)-(P)



#### ODiffuse/Narrow beam reflective







●BJ100-DDT-(C)-(P)

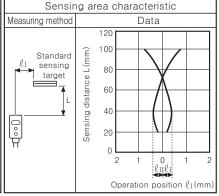
# Sensing area characteristic Measuring method Data Standard (EU) Standard (Sensing target 15 Divisor 5 Divisor 5 Double 10 Divisor 5 Data

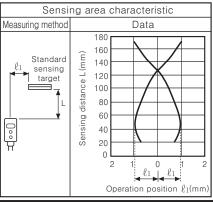
20 15 10

10 15 20

0

Operation position  $\ell_1(mm)$ 





(A) Photo electric sensor

(B) Fiber optic sensor

(C) Door/Area

(D) Proximity sensor

(E) Pressure

(F) Rotary encoder

(G) Connector/ Socket

(H) Temp. controller

(I) SSR/ Power controller

(J) Counter

Timer

(K)

Panel meter (M) Tacho/

Tacho/ Speed/ Pulse meter

Display unit

(O) Sensor controller

(P) Switching power supply

Stepping motor & Driver & Controller

Graphic/ Logic panel

(S) Field network device

(T) Production stoppage models & replacement

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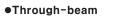
Autonics

#### ■ Feature data

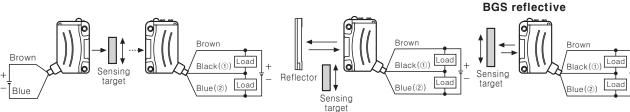
#### **OBGS** reflective

#### ●BJ30-BDT / BJ30-BDT-P ●BJ50-BDT / BJ50-BDT-P ●BJ100-BDT / BJ100-BDT-P Sensing area characteristic Sensing area characteristic Sensing area characteristic Measuring method Measuring method Data Measuring method Data Data 35 60 100 55 30 50 90 Standard 45 Standard Standard 25 80 sensing 40 sensing sensing target target target 35 distance 20 distance distance 60 30 50 15 25 40 20 Sensing Sensing Sensing 10 30 15 000 20 10 5 10 1.0 0.5 0 -0.5 -1.0 -2.0 5 -1.5 0 -1 -9 2 1 0 -1 -2 -3 -4 $\ell_1$ $\ell_1$ $\ell_1$ $\ell_1$ $\ell_1$ $\ell_1$ Operation position $\ell_1$ (mm Operation position $\ell_1$ (mm) Operation position $\ell_1$ (mm) Sensing distance by material Sensing distance by material Sensing distance by material Sensing distance L(mm) 50 50 30 40 40 distance Sensing distance 20 30 30 20 20 Sensing 10 10 10 0 PCB Acryl (Green)(Transpare White Corrugated Black Rubber paper cardboard paper (Black) PCB Acryl (Green)(Transparen Sensing target(Material) Sensing target(Material) Sensing target(Material) Sensing distance by color Sensing distance by color Sensing distance by color Sensing distance L(mm) Sensing distance L(mm) Sensing distance L(mm 50 50 30 40 40 20 30 30 20 20 10 10 10 0 White Red Orange Yellow Green Blue Navy Violet Black White Red Orange Yellow Green Blue Navy Violet Black White Red Orange Yellow Green Blue Navy Violet Black

#### Connections



Sensing target (Colored paper)



Retroreflective

Sensing target (Colored paper)

☀①: The load connection of NPN open collector output, ②: The load connection of PNP open collector output

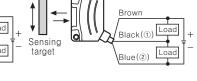
#### Connections



M8 Connector pin

Connector pin No.	Cable colors	Function
1)	Brown	Power Source(+V)
2	White	_
3	Blue	Power Source(0V)
4	Black	Output

\*\*Connector pin ② is N.C (Not Connected) terminal.



Diffuse/Narrow beam/

Sensing target(Colored paper)

Connector cable (Sold separately)

- ※Connector cable model : CID408-□, CLD408-□
- ※Please refer to G−5 for connector cable.

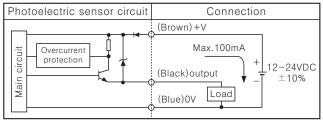
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## ■Control output diagram

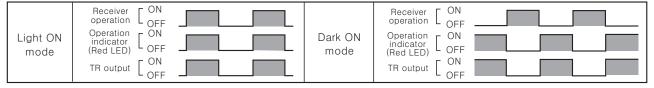


#### Connection Photoelectric sensor circuit (Brown)+V Load (Black)output 12-24VDC Over $\pm 10%$ Max.100mA current (Blue) 0V

#### PNP output

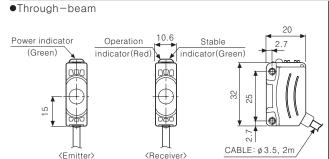


## Operation mode

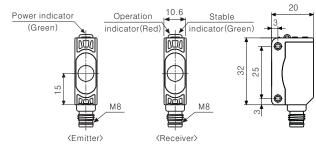


Dimensions

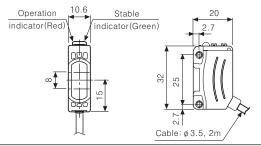
(Unit:mm)



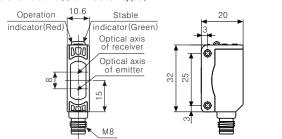
Through-beam (Connector type)



Retroreflective

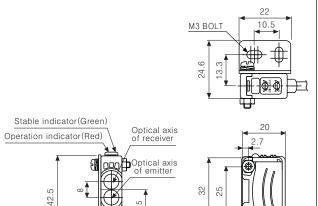


Retroreflective (Connector type)



 Diffuse/Narrow beam/BGS reflective (Connect the bracket A)

M3 Bolt



5

Cable: ø 3.5, 2m

•Diffuse reflective(Connector type) (Connect the bracket B)

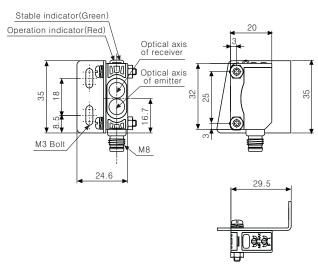


Photo electric sensor

(B) optic sensor

Door/Area

Proximity sensor

Pressure sensor

Rotary encoder

Connector/ Socket

(H) Temp.

controller

(.1) Counter

(K)

(L) Panel meter

Tacho/ Speed/ Pulse meter (N)

Display unit

Sensor controller

Switching power supply

motor & Driver &

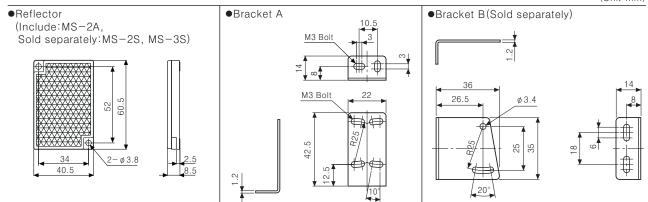
Graphic/ Logic panel

(S) Field network device

(T) roduction replacement

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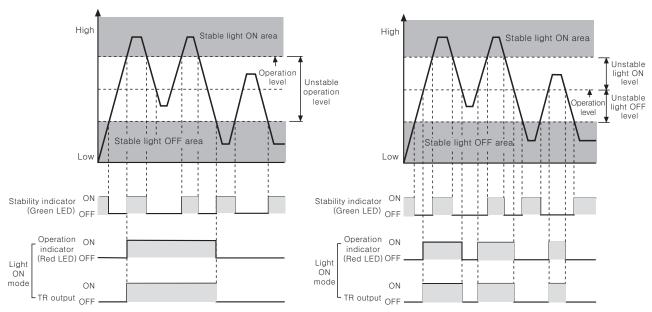
# ■ Dimensions (Unit:mm)



#### Operation timing diagram

#### **○Through-beam**

#### ODiffuse/Narrow beam/BGS reflective

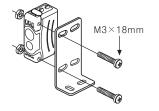


\*The waveform of "Operation indicator" and "TR output" is for Light ON mode, it is operated conversely for Dark ON mode.

# ■ Mounting and sensitivity adjustment

#### ©For mounting

Please use M3 screw for mounting of sensor, set the tightening torque under 0.5kgf·cm.



#### Switching of operation mode

Light ON operation mode (Light ON)	DL	Turn the operation switching adjuster to right(L direction), it is set as Light ON mode.
Dark ON operation mode (Dark ON)	√ D L	Turn the operation switching adjuster to left(D direction), it is set as Light OFF mode.

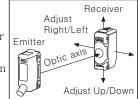
\*The operation switching adjuster is installed in the receiver for transmitted beam type.

#### Mounting

●Through-beam type

1. Place the emitter and receiver facing each other and apply the power.

2. After adjust the position of the emitter and receiver and check their stable indicating range, mount them in the middle of the range.



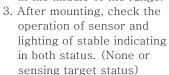
- 3. After mounting, check the operation of sensor and lighting of stable indicator in both status. (None or sensing target status)
- \*When the sensing target is translucent or small (under sensing target of **Specifications**'), it can be missed by the sensor because the light can penetrate it.

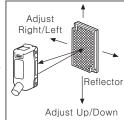
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#### •Retroreflective type

1. Place the sensor and reflector facing each other and apply the power.

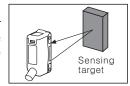
2. After adjust the position of the sensor and reflector and check their stable indicating range, mount them in the middle of the range.



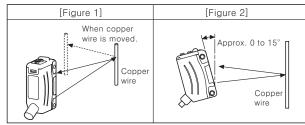


•Diffuse/Narrow beam/BGS reflective type

After place a sensing target, adjust the sensor to up or down, right or left. Then, fix the sensor in center of position where the indicator is operating.



●Object(Copper wire) detection <Micro spot type>



\*Mount sensor slanted at an angle ranged 0 to 15° shown above as [Figure 2] for stable detection to detect as shown in [Figure 1].

### Sensitivity adjustment

OSensitivity adjustment

Order Position		Description	
1	(A) MIN MAX	Turn the sensitivity adjuster to the right of min. and check position(A) where the indicator is turned on in "Light ON status".	
2	(A) (C) MIN MAX (B)	Turn the sensitivity adjuster more to the right of position(A), check position(B) where the indicator is turned on. And turn the adjuster to the left, check position(C) where the indicator is turned off in "Light OFF status".  **If the indicator is not lighted although the adjuster is turned to the max. position, the max. position is(C).	
3	Optimal sensitivity  (A) (C)  MIN MAX	Set the adjuster at the center of (A) and (C). To set the optimum sensitivity, check the operation and lighting of stable indicator with sensing target or without it.  If the indicator is not lighted, please check the sensing method again because sensitivity is unstable.	

\*No sensitivity adjustment function available for BJG30-DDT models

	"Light ON status"	"Light OFF status"		
Through- beam type	Emitter Receiver	Emitter Sensing Receiver		
Retro- reflective type	Sensor Reflector	Sensing Sensor target Reflector		
Diffuse/ Narrow beam/ BGS reflective	Sensor Sensing target Background object	Background		

- \*Set the sensitivity to operate in a stable light ON area, the reliability for the environment (Temperature, voltage, dust etc) will be increased.
- \*\*Do not apply an excessive force on adjuster, it can be broken.

(A) Photo electric

(B) Fiber optic sensor

> (C) Door/Area sensor

(D) Proximity sensor

(E) Pressure sensor

(F) Rotary encoder

(G) Connector/ Socket

(H) Temp. controller

(I) SSR/ Power controller

(J) Counter

> (K) Timer

(∟)

Panel

meter

(M)
Tacho/
Speed/
Pulse

(N) Display unit

(O) Sensor controller

(P) Switching power supply

(Q) Stepping motor & Driver & Controller

(R) Graphic/ Logic panel

(S) Field network device

(T) Production stoppage models & replacement

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